

Total Maximum Daily Load Development in the Lynchburg Watershed

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Presentation Overview

- Information on fecal bacteria
- What are Water Quality Standards?
- Lynchburg Watershed: data overview
- ABCs of TMDLs
- What happens when the TMDL is complete?

Fecal Bacteria Information

- Fecal bacteria = *E. coli* and Fecal Coliforms
- Bacteria found in the intestinal tracts of warm-blooded animals
- Presence of *E. coli* and Fecal Coliform indicates fecal contamination
 - Correlation between bacteria concentrations and incidence of gastrointestinal illness

Potential Sources of Bacteria in Lynchburg Streams

➤ Human/pet

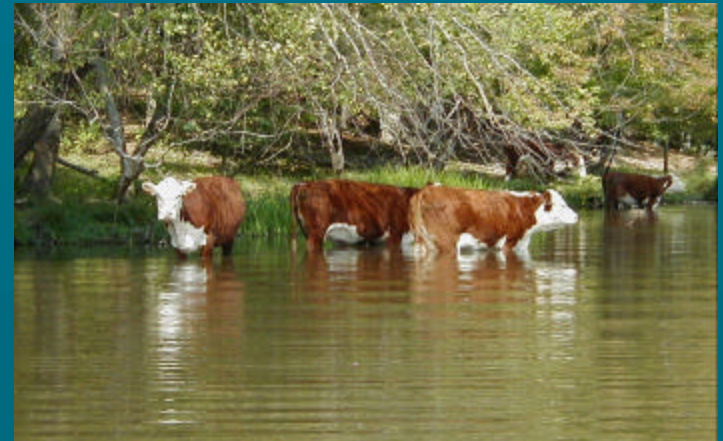
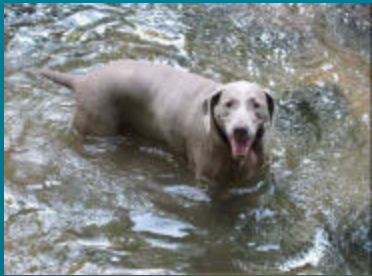
- Straight Pipes
- CSOs
- Biosolids
- Permitted Point Sources
- Pets

➤ Wildlife

- Land
- Stream

➤ Livestock

- Direct Deposit
 - Land
 - Stream
- Land Application



Water Quality Standards

- Regulations based on Federal and State law that set limits on pollutants
- Purpose of Standards is the protection of 6 designated uses:
 - Primary Contact Recreation (swimming)
 - Aquatic Life
 - Fishing
 - Shellfishing
 - Drinking Water
 - Wildlife

***E. coli* Criteria**

Indicator	Instantaneous maximum	Geometric mean
<i>E. coli</i>	235 cfu/100mL	126 cfu/100mL

Blackwater Creek @ Rivermont:

Violation Rate for 2004 assessment:

63% (10/16)

Violation Rate for period of record:

59% (32/54)



Ivy Creek @ Langhorne Rd.:

Violation Rate for 2004 assessment:

16% (3/19)

Violation Rate for period of record:

36% (22/61)



Fishing Creek @ Winchester Rd.:

Violation Rate for 2004 assessment:

32% (8/25)

Violation Rate for period of record:

50% (33/56)



James River @ Rte. 29:

Violation Rate for 2004 assessment:

31% (15/49)

Violation Rate for period of record:

39% (150/382)



Judith Creek @ Trents Ferry Rd.:
Violation Rate for period of record:
11% (2/18)



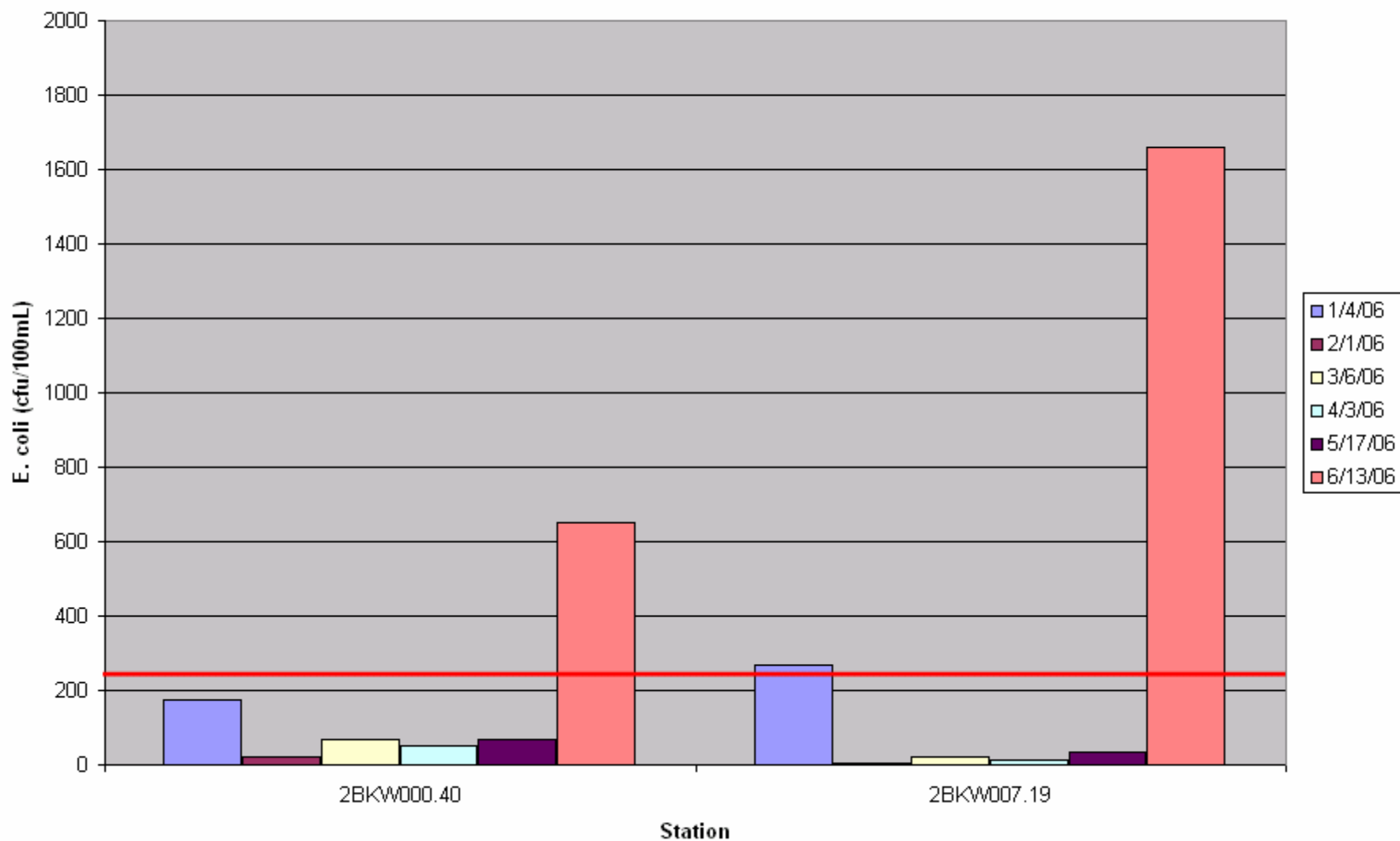
Burton Creek off Fort Ave.:
Violation Rate for period of
record: **20% (3/15)**



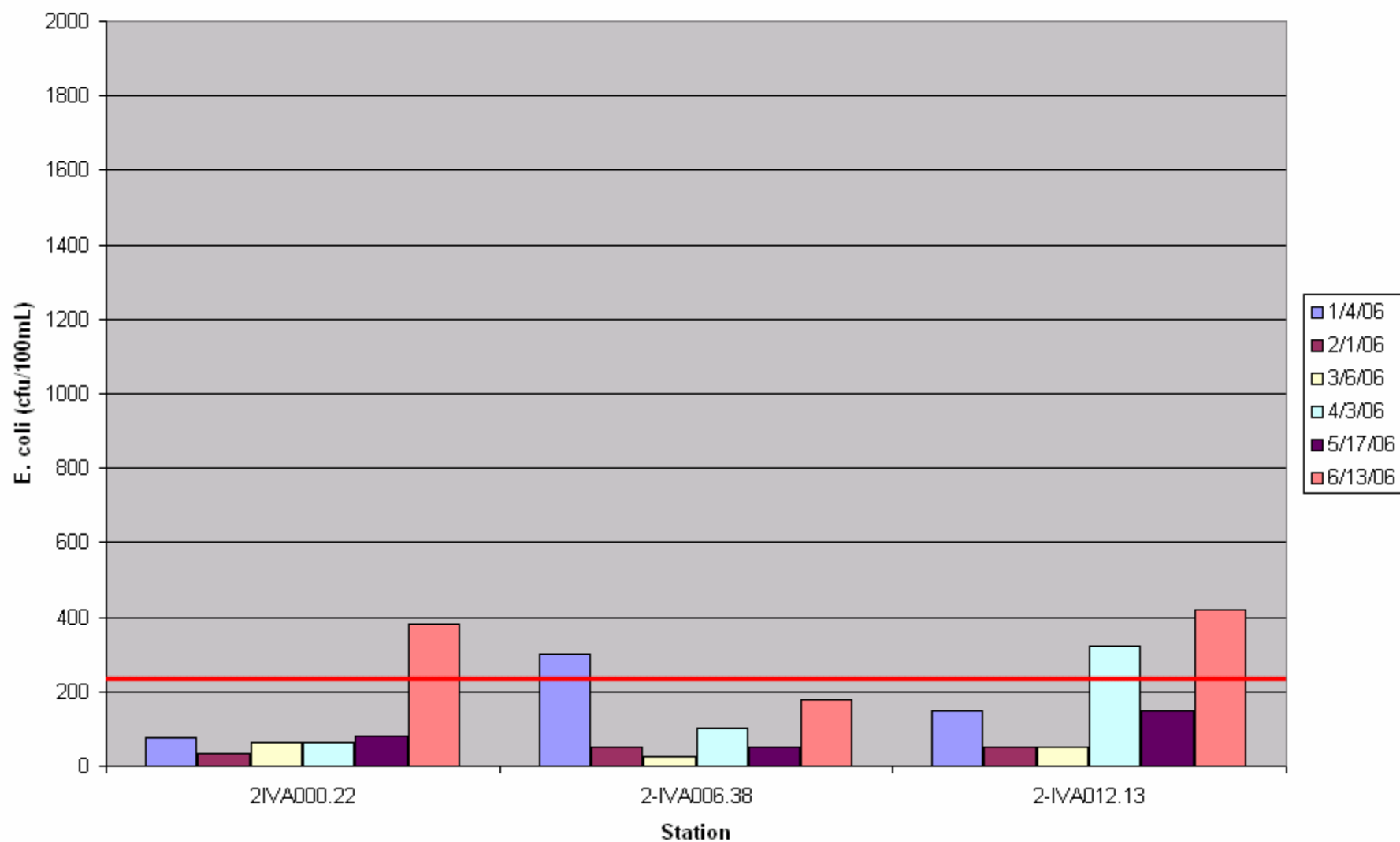
Tomahawk Creek @ McConneville Rd.:
Violation Rate for period of record:
25% (3/12)



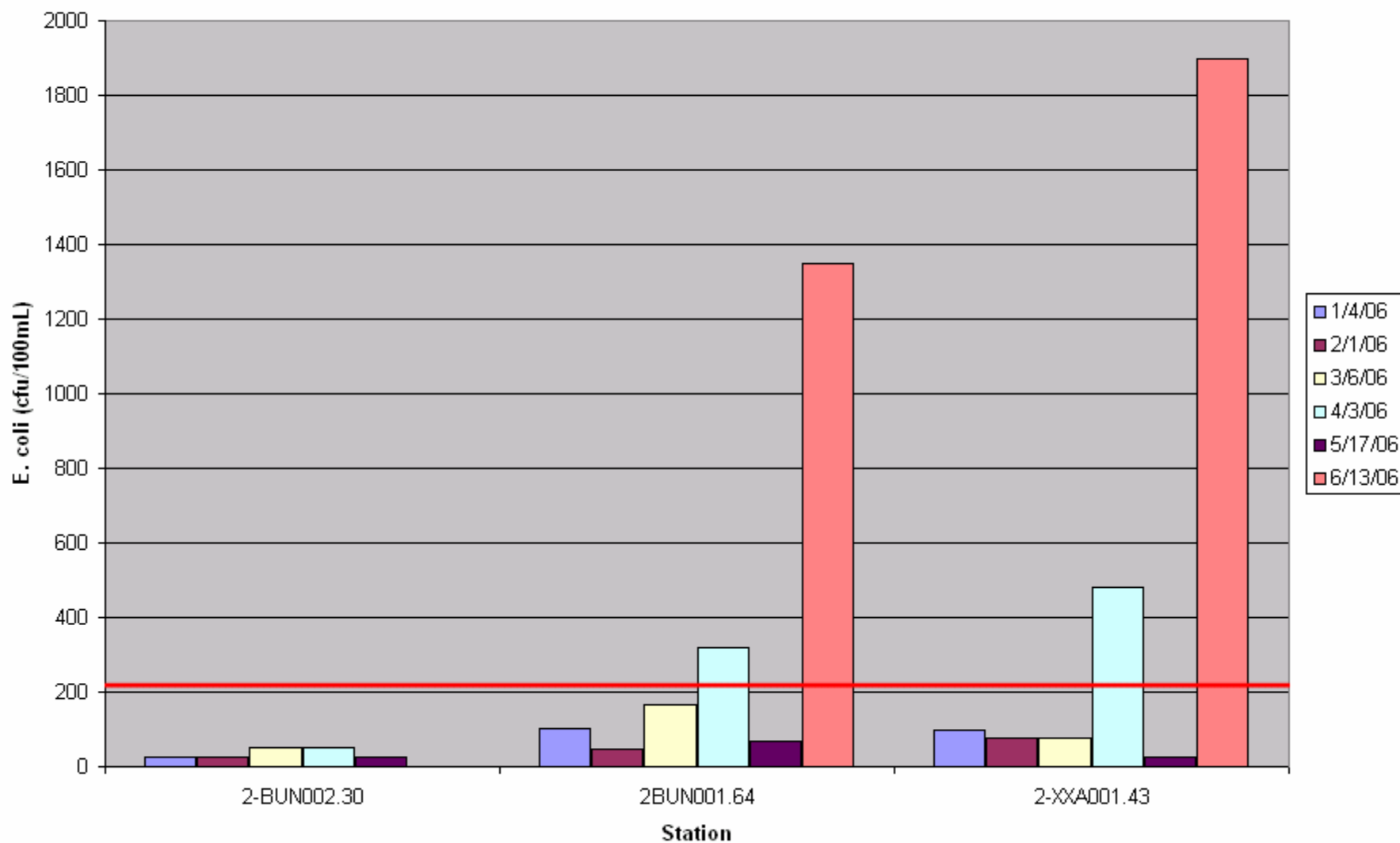
Blackwater Creek 2006 E. coli data



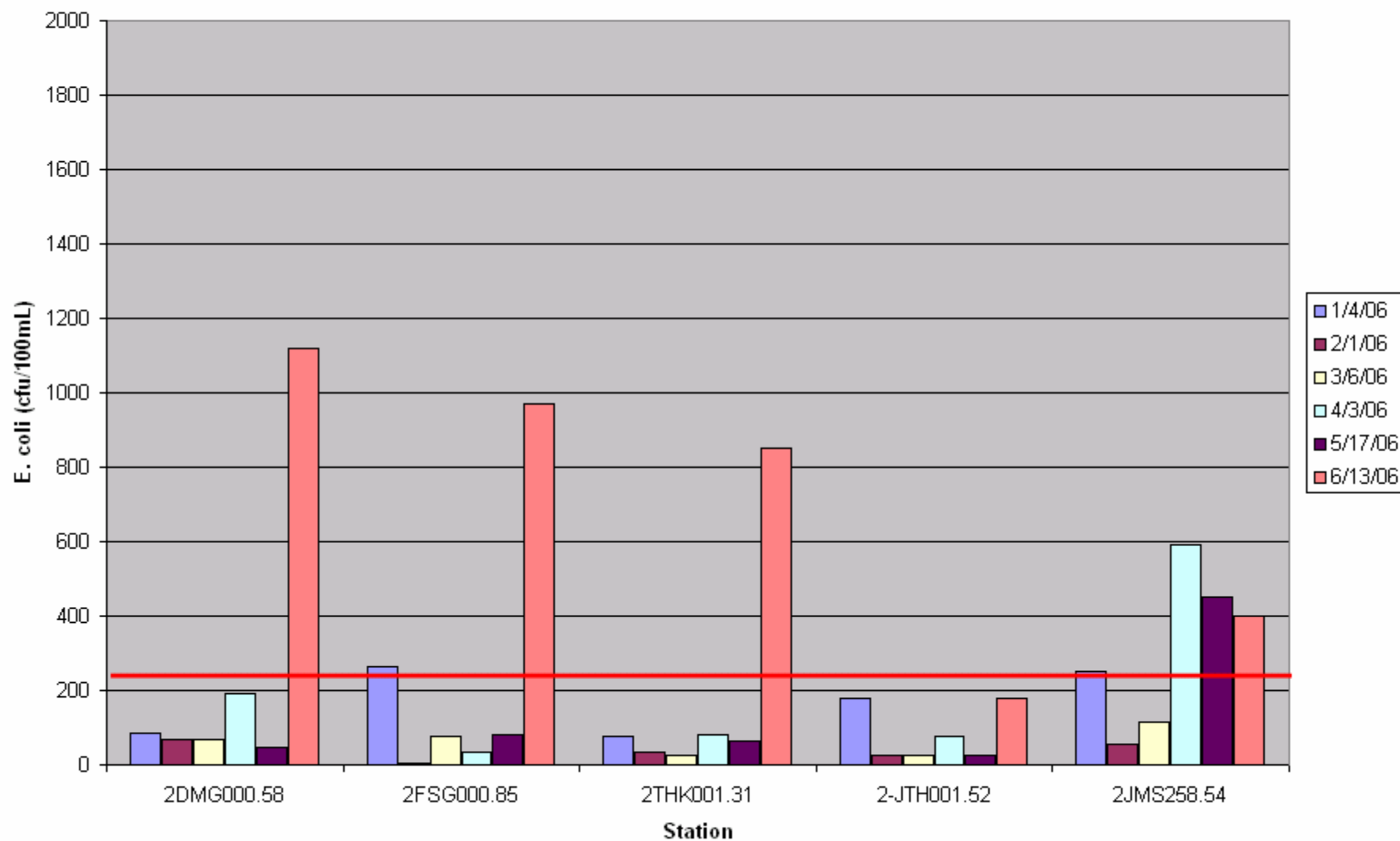
Ivy Creek 2006 E. coli data



Burton Creek 2006 E. coli data



Lynchburg area 2006 E. coli data



What is a TMDL?

- Amount of pollution a stream can receive and still meet Water Quality Standards
- A TMDL study identifies all sources of pollution
 - **Point source pollution** is discharged from a discrete location such as a pipe, tank, pit, or ditch
 - **Non-point source pollution** originates from diffuse areas (land surface or atmosphere) having no well-defined source
- Calculate the amount of *E. coli* entering the stream from each source, then determine the reductions needed from each source to meet water quality standards

What is a TMDL?

A TMDL is a pollution budget:

$$\text{TMDL} = \text{Sum of WLA} + \text{Sum of LA} + \text{MOS}$$

Where:

- TMDL = Total Maximum Daily Load
- WLA = Waste Load Allocation (point sources)
- LA = Load Allocation (non-point sources)
- MOS = Margin of Safety

Why do TMDLs?

State and Federal Regulations

- **1972 Clean Water Act (CWA)**
 - **Requires monitoring of water quality**
 - **Requires states to assess water quality and list waters as impaired if they don't meet Water Quality Standards**
 - **Develop TMDLs for impaired waters**
- **1997 Water Quality Monitoring Information and Restoration Act (WQMIRA)**
 - **Requires TMDLs for impaired waters**
 - **Requires an Implementation Plan**

How Will TMDLs Improve Water Quality?

- Identify bacteria sources
- Set allowable load to each source
- Reduce bacteria loads through:
 - Permitting
 - Public awareness
 - Voluntary programs
 - Pet waste management
 - Agricultural best management practices

TMDL Study Process

- Gather information
 - First Public Meeting to inform public
- Technical Advisory Committee (TAC) meetings to review available data and proposed modeling approach
- Final public meeting to present TMDL
- Final revisions and submittal

TMDL- 3 Part Process:

- | TMDL development
- | Implementation Plan development
- | Implement the plan



Criteria used to rank TMDLs for implementation plan development based on:

- **Location and resource priorities**
- **Reasonableness of obtaining load allocations**
- **Implementation support**

Steps after EPA Approval of TMDL

| Local staff can address TMDL through:

- Incorporate water quality issues when planning
 - Comprehensive plans, ordinances, zoning****
- Target implementation of BMPs through existing programs**
- Identify and seek grant funding opportunities**
- Initiate public outreach activities**
- Show interest to agencies**
- Continue stream monitoring: DEQ, citizen**

Contact Information

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**TMDL information available on the web at
www.deq.virginia.gov/tmdl**